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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANDREW VAKHUTINSKY and
NGAI-HANG ZACHARY LEUNG

Appeal 2016-008699
Application 13/303,235
Technology Center 3600

Before ST. JOHN COURTENAY III, JOHN A. EVANS, and NORMAN H. BEAMER, *Administrative Patent Judges*.

COURTENAY, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1, 3–8, 10–15, and 17–21, which are all the claims pending in this application. Claims 2, 9, and 16 are cancelled. We have jurisdiction over the pending claims under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

Introduction

Appellants' invention is "directed generally to a computer system, and in particular to a computer system that optimizes product pricing." (Spec. ¶ 1).

Representative Claim

Claim 1 is representative of the invention and reads as follows:

1. A non-transitory computer readable medium having instructions stored thereon that, when executed by a processor, cause the processor to determine product pricing for a product category, the determine product pricing comprising:

receiving a non-linear problem for the product category, wherein the non-linear problem comprises a demand model;

for a pair of products in the product category, determining coefficients for a change in demand of a first product of the pair when a price of a second product of the pair is changed to one or more different price levels on a second product price ladder,

and repeating the determining coefficients for at least all related pair of products in the product category;

generating binary decision variables that indicate whether price variables were assigned to a price on a corresponding price ladder;

[L1] *generating an approximate Mixed Integer Linear Programming (MILP) problem wherein a change of demand for each product is based on a sum of the determined coefficients*;

solving the MILP problem using the binary decision variables to obtain a MILP solution; and

[L2] *converting the MILP solution into the product pricing, wherein the price for each product is set to a corresponding generated binary decision variable*.

(Contested limitations L1 and L2 emphasized).

Rejections

A. Claims 1, 3–8, 10–15, and 17–21 are rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. (Final Act. 10).

B. Claims 1, 3–8, 10–15, and 17–21 are rejected under pre-AIA 35 U.S.C. § 103(a) as being obvious over Solanki et al. (US 7,996,331 B1; Aug. 9, 2011), (hereinafter "Solanki"), in view of Neal et al. (US 7,877,286 B1; Jan. 25, 2011), (hereinafter "Neal"). (Final Act. 14).

Issues on Appeal

Did the Examiner err in rejecting claims 1, 3–8, 10–15, and 17–21 under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter?

Did the Examiner err in rejecting claims 1, 3–8, 10–15, and 17–21 under pre-AIA 35 U.S.C. § 103(a) as being obvious over the cited combination of references?

ANALYSIS

We have considered all of Appellants' arguments and any evidence presented. To the extent Appellants have not advanced separate, substantive arguments for particular claims, or other issues, such arguments are waived. *See* 37 C.F.R. § 41.37(c)(1)(iv). We highlight and address specific findings and arguments for emphasis in our analysis below.

Mayo/Alice Analysis under 35 U.S.C. § 101

Under 35 U.S.C. § 101, a patent may be obtained for "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." The Supreme Court has "long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable." *Alice Corp. Pty.*

Ltd. v. CLS Bank Int'l, 134 S. Ct. 2347, 2354 (2014) (quoting *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013)). The Supreme Court in *Alice* reiterated the two-step framework previously set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66, 82–84 (2012), "for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Alice*, 134 S. Ct. at 2355.

The **first step** in that analysis is to determine whether the claims at issue are directed to one of those patent-ineligible concepts, such as an *abstract idea.* Abstract ideas may include, but are not limited to, fundamental economic practices, methods of organizing human activities, an idea of itself, and mathematical formulas or relationships. *Id.* at 2355–57.

If the claims are *not directed* to a patent-ineligible concept, *the inquiry ends. See Visual Memory LLC v. NVIDIA Corp.*, 867 F.3d 1253, 1262 (Fed. Cir. 2017).

Otherwise, the inquiry proceeds to the **second step** in which the elements of the claims are considered "individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." *Alice*, 134 S. Ct. at 2355 (quoting *Mayo*, 566 U.S. at 79, 78). We consider the question of whether the claims are directed to a *specific improvement* in the capabilities of the computing devices, or, instead, "a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool." *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1336 (Fed. Cir. 2016).

We, therefore, decide under **step two** whether the claims: (a) set forth an *inventive concept* that provides a specific means or method that *improves* the relevant technology, **or** (b) are directed to a result or effect that itself is the abstract idea, in which the claims merely invoke generic processes and machinery. *See Enfish*, 822 F.3d at 1336.

The Examiner's Rejection A under 35 U.S.C. § 101

Regarding the first part of the *Alice/Mayo* analysis, the Examiner concludes claims 1, 3–8, 10–15, and 17–21 are directed to the abstract idea of:

> applying the product information to a non-linear equation for generating a product price ladder, which is an example of **fundamental economic practices** and **mathematical relationships**, while solving the MILP problem and converting the MILP solution into the product pricing may be interpreted as the application of algorithms to achieve a new set of data, these *mathematical relationships and formulas embody a common example of an abstract idea*. Even the steps may be implemented to a computer; however, the steps are nothing more than a generic, well-understood and routine computer function, and thus an **abstract idea**.

(Final Act. 11–12) (emphasis added). [1]

Regarding the **second step** of the *Mayo/Alice* analysis, the Examiner finds the claims do not: [2]

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[1] "Patent eligibility under § 101 presents an issue of law." *Accenture Glob. Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1340 (Fed. Cir. 2013).

[2] The patent eligibility inquiry may contain underlying issues of fact. *Mortg. Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1325 (Fed. Cir. 2016). In particular, "[t]he question of whether a claim element or combination of elements is well-understood, routine and conventional to a

> amount to significantly more than the abstract idea itself. This is because the claim[s] do[] not effect an improvement to another technology or technical field; the claim[s] do[] not amount to an improvement to the functioning of a computer itself; and the claim does not move beyond a general link of the use of an abstract idea to a particular technological environment.

(Final Act. 12)

The Examiner further finds: "The recited processor is nothing more than a generic computer, for performing generic, well-understood and routine computer functions, would be required to implement the aforementioned abstract idea." (Final Act. 12). *See* n.2, *supra*. Thus, the Examiner concludes that all claims 1, 3–8, 10–15, and 17–21 on appeal are not patent-eligible under 35 U.S.C. § 101.

Mayo/Alice Analysis — Step 1

In response, and regarding *Alice* Step 1, Appellants contend, *inter alia*, that "a comparison of the multiple abstract ideas alleged by the Examiner to the abstract ideas identified by the courts shows that there are **no similarities**." (App. Br. 4).

We note Appellants' independent claim 1 is directed to, *inter alia*: generating and solving a Mixed Integer Linear Programming (MILP) problem, and using generated binary decision variables to obtain a MILP

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skilled artisan in the relevant field is a question of fact." *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018).

solution, that is converted into product pricing. Remaining independent claims 8 and 15 recite similar language of commensurate scope.[3]

Our reviewing court guides that claimed fundamental economic and conventional business practices are often abstract ideas, even if performed on a computer. *See, e.g., OIP Techs. Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362–63 (Fed. Cir. 2015); *Credit Acceptance Corp. v. Westlake Servs.*, 859 F.3d 1044, 1054 (Fed. Cir. 2017) ("Each of the claims is directed to the abstract idea of processing an application for financing a purchase.").

Thus, under a broad but reasonable interpretation, we conclude each of Appellants' claims on appeal is directed to an economic or business practice, i.e., to the *result* of "converting the MILP solution into the product pricing, wherein the price for each product is set to a corresponding generated binary decision variable." (Claim 1; *see* similar language of commensurate scope, as recited in independent claims 8 and 15). (Claims App.). However, our reviewing court guides "[t]he abstract idea exception prevents patenting a *result* where 'it matters not by what process or machinery the result is accomplished.'" *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1312 (2016) (quoting *O'Reilly v. Morse*, 56 U.S. 62, 113 (1854)) (emphasis added).

Moreover, but for the recitation of a generic processor or computer (claims 1, 8, and 15), we find the recited steps or functions which implement a mathematical algorithm could be performed as mental steps, or with the aid of pen and paper. *See CyberSource Corp. v. Retail Decisions, Inc.*, 654

[3] We give the contested claim limitations the broadest reasonable interpretation (BRI) consistent with the Specification. *See In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

F.3d 1366, 1375 (Fed. Cir. 2011) ("That purely mental processes can be unpatentable, even when performed by a computer, was precisely the holding of the Supreme Court in *Gottschalk v. Benson*.").

In the Reply Brief (2), Appellants further rebut the Examiner's conclusion the claims are directed to an abstract idea, and the Examiner's finding that the claimed steps can be entirely performed by a human using pen and paper. Appellants (*id.)* cite to *McRO* as an intervening case and urge "the present claims, as argued in the Appeal Brief, should be allowable over the prior art, [because] there is no evidence that the claimed process was *previously used either manually, or using a computer*." (Emphasis added).

However, we find the claims here are directed to a *fundamental economic practice* (**product pricing**), and are thus distinguished from the *McRo* claims that *automate lip synchronization using rules*. In *McRo*, the court emphasized that the claimed *automated lip synchronization* was patent-eligible because "the automation goes beyond merely 'organizing [existing] information into a new form' or carrying out a *fundamental economic practice*." *McRO*, 837 F.3d at 1314 (internal citation omitted) (emphasis added).

This guidance is applicable here. Therefore, on this record, we are not persuaded of error regarding the Examiner's legal conclusion that all claims on appeal are directed to the abstract ideas of: (i) a fundamental economic practice" and (ii) a mathematical algorithm. (Final Act. 11–12). We particularly note the *literal mathematical terms and expressions* expressly recited in dependent claims 4–7, 11–14, and 18–21.

Mayo/Alice Analysis – Step 2

Because the claims are directed to an abstract idea, we turn to the second part of the *Alice/Mayo* analysis. We analyze the claims to determine if there are additional limitations that individually, or as an ordered combination, ensure the claims amount to "significantly more" than the abstract idea. *Alice*, 134 S. Ct. at 2357.

Regarding *Alice* Step 2, Appellants urge: "Even if the claims are considered to be directed to an abstract idea (not admitted by Applicants), the claims can include an 'inventive concept' or additional elements so that the abstract idea is transformed into a patent-eligible application. *Alice*, 134 S. Ct. at 2357." (App. Br. 5).

In support, Appellants merely recite the claim language, and assert:

> Generating a MILP problem, solving the problem and converting the solution to generate product pricing elevates the present claims well "beyond the mere concept of simply retrieving and combining data using a computer." Further, the use of a computer to generate and solve a MILP problem is clearly a technical solution to the problem of determining product pricing and is not a solution that can be performed manually or using routine computer data storage and mathematical operations.

(App. Br. 6).

Appellants' arguments do not persuade us the Examiner erred, because Appellants essentially recite the claim limitations without any persuasive explanation of how the limitations either individually, or as an ordered combination, amount to an **inventive concept** that **converts** the **abstract idea** (i.e., the fundamental economic practice of determining product pricing) into patent-eligible subject matter.

Appellants urge: "The recited functionality of the claims improves the

functioning of the computer." (App. Br. 7) (emphasis omitted). However, to the extent that Appellants' recited steps or acts (or functions) may be performed faster or more efficiently using a computer, our reviewing court provides applicable guidance:

> While the claimed system and method certainly purport to accelerate the process of analyzing audit log data, **the speed increase comes from the capabilities of a general-purpose computer, rather than the patented method itself**. *See Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012) ("[T]he fact that the required calculations could be performed **more efficiently** via a computer does not materially alter the patent eligibility of the claimed subject matter.").

FairWarning IP, LLC v. Iatric Sys., Inc., 839 F.3d 1089, 1095 (Fed. Cir. 2016) (emphases added).

Further regarding the use of a generic processor, *see Alice*, 134 S. Ct. at 2358, holding that "the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention;" *Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1348 (Fed. Cir. 2016) ("An abstract idea on 'an Internet computer network' or on a generic computer is still an abstract idea."); *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1355 (Fed. Cir. 2016) (quotation omitted); ("We have repeatedly held that such invocations of computers and networks that are not even arguably inventive are 'insufficient to pass the test of an inventive concept in the application' of an abstract idea.") (quotations omitted); *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1341 (Fed. Cir. 2017) ("Rather, the claims recite both a generic computer element—a processor—and a series of generic computer 'components' that merely restate their individual functions . . . . That is to

say, they merely describe the functions of the abstract idea itself, without particularity. This is simply not enough under step two.").

Appellants further urge: "As is clear from the cited prior art, there are many known techniques for determining product pricing for a product category. Therefore, the alleged abstract idea as recited in the present claims will not **preempt** the entire field of product pricing." (App. Br. 7) (emphasis added).

Our reviewing court provides applicable guidance: "while preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1372 (Fed. Cir. 2015). Therefore, we are not persuaded by Appellants' argument regarding the absence of complete preemption.

Appellants summarize their arguments under *Alice, step two*:

> In particular, the claims, in combination, recite, inter alia, a first element of "generating an approximate Mixed Integer Linear Programming (MILP) problem . . . based on a sum of the determined coefficients", a second element of "solving the MILP problem using the binary decision variables to obtain a MILP solution", and a third element of "converting the MILP solution into the product pricing, wherein the price for each product is set to a corresponding generated binary decision variable". Therefore, each element works with other elements, and in combination amounts to significantly more.

(App. Br. 9).

However, the category of abstract ideas embraces "fundamental economic practice[s] long prevalent in our system of commerce." *Alice*, 134 S. Ct. at 2356. Here, it is our view that merchants have long determined

product pricing using various modeling algorithms that take into account demand and changes in demand with respect to offerings of other competing products, which may be substitutes. This practice is a common fundamental economic and business practice (e.g., applying the common economic principles of *price elasticity of demand*, and considering *elastic demand* versus *inelastic demand*). Furthermore, "simply appending conventional steps, specified at a high level of generality, to laws of nature, natural phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable." *Mayo*, 566 U.S. at 82.

Nor do we find Appellants' claims similar to the claimed solution the court held to be patent-eligible in *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014). Here, we conclude Appellants' claimed solution is not rooted in computer technology, such that the invention on appeal overcomes a problem specifically arising in the realm of computers, including computer networks, as was the case with the type of claim the court concluded was patent-eligible in *DDR Holdings*.[4] (*Id.* at 1257).

We further conclude that independent claims 1, 8, and 15 are not related to the type of patent-eligible database claim considered by the court in *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016). We note all claims 1, 3–8, 10–15, and 17–21 on appeal are silent regarding any mention of a database. Therefore, none of Appellants' claims is directed to a "self-referential table for a computer database" of the type considered in *Enfish*, 822 F.3d at 1336.

[4] We note Appellants' claims on appeal are silent regarding any mention of a computer "network."

In the Reply Brief (3), Appellants additionally cite to *BASCOM Global Internet Services, Inc. v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016), as a second intervening case. However, the court guides in *Bascom*, 827 F.3d at 1348, that implementing "[a]n abstract idea on 'an Internet computer network' or on a generic computer is still an abstract idea."

We find nothing in the claims on appeal that focuses on a specific means or method that *improves* the recited "processor" or "computer." (Independent claims 1, 8, and 15). In particular, we find the claims on appeal are *silent* regarding specific limitations directed to an *improved* computer system, processor, memory, network, database, or Internet.

Our reviewing court provides guidance regarding the use of such *generic computers* and/or computer/network components. *Elec. Power Grp.*, 830 F.3d at 1355 ("We have repeatedly held that such invocations of computers and networks that are not even arguably inventive are 'insufficient to pass the test of an inventive concept in the application' of an abstract idea.") (Citation omitted)); *Intellectual Ventures I*, 850 F.3d at 1341 ("Rather, the claims recite both a generic computer element—a processor—and a series of generic computer 'components' that merely restate their individual functions . . . . That is to say, they merely describe the functions of the abstract idea itself, without particularity. This is simply not enough under step two.").

We emphasize that our review for patent-eligible subject matter under 35 U.S.C. § 101 is independent from our review of the second ground of

rejection presented in this appeal, which is based upon obviousness (and addressed *infra*). [5]

Because none of Appellants' claims on appeal is directed to an *improvement* in a processor, database, or other computer/network component, we conclude that none of the claim limitations, viewed "both individually and as an ordered combination," amounts to significantly more than the judicial exception in order to sufficiently transform the nature of the claims into patent-eligible subject matter. *See Alice*, 134 S. Ct. at 2355 (internal quotations omitted) (quoting *Mayo*, 566 U.S. at 79).

Applying the aforementioned guidance from our reviewing courts to the claims before us on appeal, we conclude, in our *Mayo/Alice* analysis, that each of Appellants' claims 1, 3–8, 10–15, and 17–21, considered as a whole, is directed to (under *step one*), *a patent-ineligible abstract idea,* and under *step two*, does not recite something "*significantly more*" to transform the nature of the claim into a patent-eligible application.

Therefore, we conclude the additional elements recited in the claims of a processor or a computer, and the inclusion of certain steps, acts, or functions that may be performed without a computer as mental steps

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[5] The Supreme Court emphasizes: "[t]he 'novelty' of any element or steps in a process, or even of the process itself, is of **no relevance** in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter." *Diamond v. Diehr*, 450 U.S. 175, 188–89 (1981) (emphasis added). Our reviewing court further guides that "[e]ligibility and novelty are separate inquiries." *Two-Way Media Ltd. v. Comcast Cable Comm., LLC*, 874 F.3d 1329, 1340 (Fed. Cir. 2017); *see also Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1263 (Fed. Cir. 2016) (holding that "[e]ven assuming" that a particular claimed feature was novel does not "avoid the problem of abstractness").

(although more slowly than a computer using pen and paper), *do not provide an inventive concept, without more.* Accordingly, for at least the reasons discussed above, we sustain the Examiner's rejection under 35 U.S.C. § 101 of claims 1, 3–8, 10–15, and 17–21, as being directed to patent-ineligible subject matter in light of *Alice* and its progeny.[6]

Rejection B of Claims 1, 3–8, 10–15, and 17–21 under § 103(a)

Regarding the obviousness rejection, Appellants contend, *inter alia*:

> in Solanki, the input to the MILP problem is a non-linear or linear optimization program, in contrast to embodiments of the present invention in which the input is the coefficients as claimed and the decision variables. There is no suggestion in Solanki to generate an approximate Mixed Integer Linear Programming ("MILP") problem that includes a change of demand based on a sum of the determined coefficients from pairs of products. Further, Solanki fails to disclose "converting the MILP solution into the product pricing, wherein the price for each product is set to a corresponding generated binary decision variable."

(App. Br. 10–11).

Issue: Under pre-AIA 35 U.S.C. § 103(a), did the Examiner err by finding Solanki and Neal *collectively* teach or suggest contested limitations L1 and L2:

> [L1] *generating an approximate Mixed Integer Linear Programming (MILP) problem wherein a change of demand for each product is based on a sum of the determined coefficients*;
>
> [and]

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[6] To the extent Appellants have not advanced separate, substantive arguments for particular claims, or other issues, such arguments are waived. *See* 37 C.F.R. § 41.37(c)(1)(iv).

> [L2] *converting the MILP solution into the product pricing, wherein the price for each product is set to a corresponding generated binary decision variable*[,]

within the meaning of representative claim 1? *See* n.3, *supra*. (Emphasis added).

Based upon our review of the record, we find consideration of Appellants' arguments pertaining to limitation L1 ("*wherein a change of demand for each product is based on a* **sum** *of the determined coefficients*") is dispositive to the obviousness rejection B before us on appeal. (Emphasis added).

The Examiner finds Solanki teaches or suggests contested limitation L1 at col. 5, lines 9–57; col. 6, line 19 to col. 7, line 24. (Final Act. 14). [7]

In the Answer (10–11), the Examiner further explains the basis for the rejection:

> Solanki discloses a coefficient (effect, weight) can be used to indicate the change in the demand for an item at a location by its own price and the price of other (second) items that have cross effect on the demand (see col. 6, lines 19-67). *Obviously Solanki has calculated the coefficient, and the coefficient is used to indicate the demand change relationship between the first item and the second item.*

(Emphasis added).

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[7] The Examiner finds Neal teaches or suggests contested limitation L2: "converting the MILP solution into the product pricing (see col. 50, line 62 to col. 52, line 67), wherein the price for each product is set to a corresponding generated binary (0, 1) decision variable (see col. 22, line 37 to col. 23, line 19 and col. 48, line 38 to col. 49, line 16)." (Final Act. 16).

Regarding contested limitation L1, we note Appellants admit that "[t]he primary reference, Solanki, *performs price optimization and uses a MILP problem*." (App. Br. 10) (emphasis added).

However, Appellants urge that Solanki "otherwise functions differently than the present invention." (App. Br. 10). Appellants specifically contend "in Solanki, the input to the MILP problem is a non-linear or linear optimization program, in contrast to embodiments of the present invention in which the input is the coefficients as claimed and the decision variables." (App. Br. 10). Appellants emphasize: "There is no suggestion in Solanki to generate an approximate Mixed Integer Linear Programming ("MILP") problem that includes *a change of demand based on* **a sum** *of the determined coefficients from pairs of products*." (App. Br. 10–11) (emphasis added and omitted).

We note Solanki expressly refers to use of "[a] mixed integer linear programming problem [that] is solved to snap prices to grid points." (Abstract; *see also* col. 3, ll. 37–41: "mixed integer linear optimization program **58** optimizes the solutions produced by the non-linear optimization program **44** or linear optimization program **46** for the sub-problems **54**.").

The Examiner states that *even assuming Solanki does not explicitly disclose determining coefficients for a change in demand* of a first product when a price of a second product is changed, the Examiner finds:

> Neal discloses *determining coefficients for a change in demand* of a first product when a price of a second product is changed to one or more different price levels on a second product price ladder (see col. 26, line 9: the cross-elasticity variable is to quantify the effects of sales of one (first) demand group upon the sales of another (second) demand group; See example on column 23, Tables A and B, when examining a first demand

> group, the sales of other demand groups within the same category are treated as variables which affect the sales of the first demand group; The coefficient estimator uses these imputed variables and data to estimate coefficients, which may be used in an equation to predict demand. The sales for a demand group (S) is calculated and a market share (F) for a particular product is calculated. So that demand (D) for a particular product is estimated by D=SF.A demand group is defined as a collection of highly substitutable product; col. 48, lines 20-60; and col. 50, lines 41-67), and repeating the determining coefficients for at least *all related pair of products* in the product category (see col. 45, lines 46-54 and col. 62, lines 26-36: repeat solving the related problem involving all the linear constraints).

(Ans. 11) (emphasis added).

We note Neal further describes: "[t]he coefficient estimator **308** uses the imputed variables demand groups and data to estimate coefficients, which may be used in an equation to predict demand." (Col. 25, ll. 21–23). Although we have reviewed the various coefficients described in Neal, we find the Examiner has not fully developed the record to clearly establish "wherein a change of demand for each product is based on a **sum** of the determined coefficients" (Claim 1) (emphasis added). Nor do we find Solanki overcomes the deficiency of Neal.

At best, we find Solanki teaches "representing the **weighted sum** of margin penalties" (col. 10, l. 44), "representing the **weighted sum** of competition penalties" (col. 10, l. 53), and "representing the **weighted sum** of item relationship penalties (col. 10, l. 63)," which we find bear little relationship to: "[L1] *generating an approximate Mixed Integer Linear Programming (MILP) problem wherein a change of demand for each product is based on a* **sum** *of the determined coefficients*;" as recited in claim 1.

Therefore, on this record, we find a preponderance of the evidence supports the Appellants' contention that the Examiner has not shown how either Solanki or Neal teach or suggest at least contested limitation L1. *See* App. Br. 10–13.

Accordingly, we reverse § 103(a) rejection B of independent claim 1. For the same reasons, we reverse rejection B of independent claims 8 and 15, which recite contested limitation L1 using similar language of commensurate scope. The remaining dependent claims rejected under rejection B stand with their respective independent claim (1, 8, or 15).

CONCLUSIONS

The Examiner did not err in rejecting claims 1, 3–8, 10–15, and 17–21, under 35 U.S.C. § 101, as being directed to patent-ineligible subject matter.

The Examiner erred in rejecting claims 1, 3–8, 10–15, and 17–21, under pre-AIA 35 U.S.C. § 103(a), as being obvious over the combined teachings and suggestions of the cited references.

DECISION

We affirm the Examiner's decision rejecting claims 1, 3–8, 10–15, and 17–21, under 35 U.S.C. § 101.

We reverse the Examiner's decision rejecting claims 1, 3–8, 10–15, and 17–21, under pre-AIA 35 U.S.C. § 103(a).

Because we have affirmed at least one ground of rejection with respect to each claim on appeal, the Examiner's decision is affirmed. *See* 37 C.F.R. § 41.50(a)(1).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv). *See* 37 C.F.R. § 41.50(f).

AFFIRMED